SPECIES AND HABITAT: WILDLIFE APPENDIX

WL Appendix-A: Northern Spotted Owl Habitat

The WL Appendix Map-1:Northern Spotted Owl Habitat was prepared by reclassing Western Oregon Digital Image Product (WODIP) vegetation data. The WODIP vegetation data are satellite data from Landsat Thematic Mapper. We reclassified the WODIP data based on the criteria used when we stratified FOI data (Instruction Memorandum No. OR-91-447) for use in the Spatially Explicit Life-History Simulator for the Northern Spotted Owl (Appendix IV-I USDI 1992). The results from that simulation were used in preparing the Draft Coos Bay District RMP-EIS (USDI 1992). The reclass options in WODIP do not directly correspond to the query options in FOI. We approximated the earlier sort criteria as shown in Table NSO-1:

Table NSO-1: Northern Spotted Owl Habitat WODIP Reclass

FOI Query for Life-History Simulator:	WODIP Reclass:	reclass #
Nesting Habitat: 21 inch+ d.b.h., and 2-bar stocking or better or 21 inch+ d.b.h., 1-bar stocking with an understory	20 inch+ d.b.h., and 35% to 95% crown closure or 20 inch+ d.b.h., 5% to 95% crown closure, and 2-story	conifer: 6 hdwd: 9 mixed: 12
Dispersal Habitat: 11 to 21 inch d.b.h., 2-bar stocking or better	10 to 19 inch d.b.h., and 35%+ crown closure	conifer: 5 hdwd: 8 mixed: 11
Nonsuitable Habitat	water	1
	urban and agriculture	2
	clearcuts, nonforest, barren, young plantations, other	3
	Nonsuitable stands: stands averaging <10 inches d.b.h. or stands <35% and 1-story	conifer: 4 hdwd: 7 mixed: 10

Data Limitations (from the WODIP Handbook):
The Landsat data has a pixel size of 30 by 30 meters. Any feature less than 30 meters across will probably not be identified in the imagery. Exceptions include features that are drastically different from their surroundings. Vegetation maps derived from satellite data strive to attain an overall accuracy of 80%. Some cover types have unique energy reflective properties that are easier to identify, and therefore are classified more accurately. Other land cover types have similar reflective characteristics, which leads to mis-classification. Examples of such cover types are agriculture fields and recent clearcuts, dense brush and small hardwoods. For additional information on WODIP, see The WODIP Guidebook (Nighbert *et al*. 1997).

Other Data Limitations:
Young stands with shadowy canopy gaps caused by nonforest-rockland conditions, where the gaps have diameters that approximate the diameters of old-growth tree crowns, have a reflective signature similar to large diameter trees. Depending on how the data are reclassed, this can result in an over estimate of the area occupied by larger diameter trees. Side by side examples of correctly and incorrectly classed "nesting habitat" (reclassed to include conifers greater than 20+ inch average dbh among other criteria) are visible on the South Fork Coos Watershed Analysis WL Appendix Map-1: Northern Spotted Owl Habitat where nesting habitat is shown in the Goose Gulch Drainage (sections 11, 12, 13, & 14, T.27S, R.9W., Will. Mer.) (USDI 1999). The old-growth in that area consists of scattered trees and open stands with well stocked understory stands of 40-year old trees. In the same area are 40-year old single-story stands. Those young stands are pocked and dissected by rock outcrops, which appear to have caused those stands to be miss-classed as nesting habitat. While this example suggests the reclassed WODIP data overestimates the "nesting habitat," local knowledge indicates the WODIP estimate of nesting habitat is at least 80% correct. Overall, the WODIP map appears more accurate for BLM land than similar maps created using the FOI data base.

Old growth can have a reflective signature similar to water. Examples of this error can be seen in the Upper North Coquille drainage on the WL Appendix Map-1: Northern Spotted Owl Habitat.

Landsat data acres will not necessarily equal acres generated using GIS vector data. Landsat data is composed of 30-

meter pixels, which results in blocky angular edges around areas of equal value. GIS vector data is composed of polygons with smooth boundaries around areas of equal value. Overlaying the angular edged pixel data with the smooth edged vector data inevitably produces acre discrepancies because the two data types do not share common boundaries. In this analysis the discrepancies are about one third of one percent (Tables NSO-2 and NSO-3).

Table NSO-2: Analysis of Error Associated with Combining Vector and Pixel Data

Land Use allocation (before accounting for Riparian Reserve acres)	Acres from LUA theme (vector data)	Acres based on WODIP (pixel data) clipped by LUA theme	The difference in acres	The difference as percent of LUA theme acres
Research Natural Area (RNA)[1]	564.74	563.95	0.79	0.14%
Connectivity (CON)	847.20	844.68	2.52	0.30%
General Forest Management Area (GFMA)	19,791.97	19,727.45	64.52	0.33%
Late-Successional Reserve (LSR)	15,657.17	15,600.06	57.11	0.36%

Table NSO-3: Analysis of Error Associated with Combining Vector and Pixel Data For Riparian Reserve Acres

Land Use allocation	Acres from LUA theme (vector data)	Acres based on WODIP (pixel data) clipped by LUA theme	The difference in acres	The difference as percent of LUA theme acres
Riparian Reserve	19,275.58	19,226.39	49.19	0.26%

The acres of Late-Successional Reserve (LSR), shown in Table NSO-4, are based on the mapped LSRs in 1994 and do not reflect Matrix lands surrounding known northern spotted owl and marbled murrlet sites that are managed for LSR objectives. Consequently, the acres of LSR are underestimated and the acres of matrix are over estimated.

[1] Since 1993, the Cherry Creek RNA has sometimes been erroneously called a “congressional withdraw,” or a “congressional reserve.” This error comes about because, for the purpose of developing the Forest Plan, the acres in RNAs were included with congressionally reserved areas, which include wilderness areas, national parks and monuments, national wildlife refuges, wild and scenic rivers and military reservations. As a result, RNAs were assigned the attribute “CGRR” in the GIS data set. “CGRR” is shorthand for congressional reserve. Unfortunately, people unfamiliar with the administrative history of the RNA assume these sites are congressional reserves and not just tracked in the same category as congressional reserves.

Table NSO-4. Acres of Northern Spotted Owl Habitat Based on Reclassed 1993 Landsat Data

		Acres by reclass:										
		NS: nonforest/ young forest			NS: conifer	suitable conifer		NS: hdwd	suitable hdwd	suitable hdwd	NS: mixed	all classes
		water	agr.	nf, cc, young	<10 in. dbh	10-19 in. dbh	20+ in. dbh	<10 in. dbh	10-19 in. dbh	20+ in. dbh	<10 in. dbh	
reclass number ?		1	2	3	4	5	6	7	8	9	10	
Land Use Allocation (LUA) acres before Interim Riparian Reserve acres are subtracted	Late-Successional Reserve (LSR)	9	0	2,040	3,191	2,507	5,255	251	1,502	312	532	15,600
	Research Natural Area (RNA)	0	0	13	28	57	431	0	30	4	1	564
	Matrix: Connectivity (CON)	0	10	163	89	82	265	7	184	37	6	845
	Matrix: GFMA	0	56	2,269	4,173	6,109	3,546	256	2,193	566	559	19,727
Total BLM all LUAs		9	67	4,485	7,482	8,756	9,498	513	3,909	918	1,098	36,736
Interim Riparian Reserve acres within other land use allocation blocks	Riparian Reserves inside LSR	6	0	956	1,710	1,154	2,844	158	1,095	235	303	8,461
	Riparian Reserves inside RNA	0	0	12	18	27	228	0	26	3	0	315
	Riparian Reserves inside CON	0	8	124	44	32	125	4	120	25	3	485
	Riparian Reserves inside GFMA	0	43	1,224	2,117	2,506	1,780	133	1,489	374	299	9,966
Total BLM Riparian Reserve acres		6	52	2,317	3,890	3,719	4,976	294	2,729	637	606	19,226
Land Use Allocation (LUA) acres minus the Interim Riparian Reserve acres	LSR outside the Riparian Reserve	3	0	1,084	1,481	1,353	2,412	93	407	77	229	7,139
	RNA outside the Riparian Reserve	0	0	1	10	30	203	0	4	0	1	249
	CON outside the Riparian Reserve	0	2	39	45	50	140	4	65	12	3	360
	GFMA outside the Riparian Reserve	0	13	1,044	2,056	3,603	1,767	123	704	191	260	9,762
Total BLM land outside the Riparian Reserve		3	15	2,168	3,593	5,037	4,522	219	1,180	280	492	17,510
Total BLM all LUAs		9	67	4,485	7,482	8,756	9,498	513	3,909	918	1,098	36,736
private/ other acres		1	9,297	14,123	10,537	8,579	7,189	1,202	6,891	2,311	1,381	61,511
Total acres for the Watershed		10	9,364	18,609	18,019	17,334	16,687	1,716	10,800	3,229	2,479	98,247

The percent suitable habitat acres shown in Table NSO-5: Suitable Habitat Acres for Northern Spotted Owl Sites in the South Fork Coos Watershed are based on FOI data. These percentages of suitable habitat are a measure of habitat immediately around nest sites.

Table NSO-5: Suitable Habitat Acres for Northern Spotted Owl Sites in the North Fork Coquille Watershed

Site Name	Master Site Number	Percent Suitable Habitat Acres[1]	Lua Where Site Center Is Located	Pair Status of Site
Alder Creek	0547	28	LSR	Pair
Alder Creek (Honcho)	0547A	30	LSR	Pair
Alder Creek (Honcho)	0547B	28	LSR	Pair
Cherry Creek	0069	42	LSR	Pair
Cherry Creek	0069A	45	LSR	Pair
Cherry Creek	0069B	44	LSR	Pair
Cherry Creek Ridge	2352	25	Matrix	Pair
Cherry Creek Ridge	2352A	28	Matrix	Pair
Hudson Creek	2324	3	Matrix	Pair
Lower North Fork Coquille	2326	6	LSR	Pair
North Fork Coquille	0545	38	LSR	Pair
North Fork Coquille	0545A	40	LSR	Pair
North Fork Coquille	0545B	40	LSR	Pair
North Fork Coquille	0545C	40	LSR	Pair
Park Creek	2168	35	LSR	Pair
Vaughns Creek	2171	35	LSR	Pair
West Vaughns Creek	3154	40	LSR	Pair

[1]Percent suitable habitat acres is the percentage of suitable nesting, roosting, and foraging habitat on BLM lands within a 1.5 mile radius circle surrounding each spotted owl nest site. Existing habitat may be located within more than one circle, because many of these circles overlap other circles. In instances where circles extend outside the boundaries of the North Fork Coquille watershed, the percentage of suitable habitat is calculated on the entire 1.5 mile radius circle.

References

Nighbert, J.; O'Neil, J.; Byrd, A. 1997. Western Oregon Digital Image Project - WODIP Guidebook, for the Bureau of Land Management. Portland, OR.

USDI Bureau of Land Management. 1992. Final - Coos Bay District Proposed Resource Management Plan and Environmental Impact Statement, 2 Vol. and Map Package (PRMP/EIS). North Bend, OR.

USDI. 1997. South Fork Coos Watershed Analysis. On file at the Coos Bay BLM Dist. Office, North Bend, OR. 116 pg. + maps and appendices.

WL Appendix-B: Coarse Wood Debris

Management Direction/ Assessment Recommendations on CWD for Density Management Projects in the LSR:

The Forest Plan ROD says a management assessment should be prepared for each LSR (or group of smaller LSRs) before habitat manipulation activities are planned and implemented. The LSR Assessment (USDI; USDA 1998) prepared in accordance to the Forest Plan contains the following guidance and recommendations on managing CWD in density management projects:

Desired Future Conditions

. . . Maintain and/ or restore key structural components (large trees, snags and down logs) to mimic the abundance, condition and distribution of these structures. . . (pg. 62)

Treatment Guidelines for NSO Home Ranges

. . . When considering treatments of these stands the IDT should maintain . . . CWD. (pg. 70)

Density Management-Commercial thinning

. . . Where necessary, active recruitment of snags/ CWD . . . can be done concurrently [with thinning]. *. . . Besides shaping the overstory, density management may also focus on creating gaps, setting the stage for understory regeneration, and recruiting snags and CWD.* (pg. 80)

Density Management in Riparian Reserves [that are also inside the LSR]

The guidelines shown in Table [below] are recommendations for the coarse wood levels that should exist at stand age 80 [for LSR stands that are also inside the Riparian Reserve].

Recommended Range for Retention Levels of CWD (cu.ft./ac.)

Province	*Within the First Site Potential Tree Height from Any Perennial Stream*	*Within the Second Site Potential Tree Height from Any Perennial or First Site Potential of Any Intermittent Stream*
Coast Range	*3,600 - 9,400* [1]	*1,600 - 2,300* [3]
Klamath	*650 - 1,300* [2]	*650 - 1,300* [2]

[1] *Ursitti, 1990. Includes all wood 4 inches and 1 meter in length and longer*
[2] *Bingham, 1991*
[3] *Spies; Franklin, 1988, 1991* [includes all CWD 4-inches and larger no minimum length]

Prior to management activities, coarse wood surveys should be conducted in order to determine current wood levels. It is expected that in some stands, current levels will not meet the above guidance. Where this is the case, addition of wood during the proposed management activity may be necessary. It may not be possible, nor preferable, to meet the full guidance at the time of entry but rather to calculate the needs for the future stand [and prepare a strategy how the desired levels of CWD will be attained.] (pg. 90-91)

REO Review Exemption Criteria (attached to the LSR Assessment)

. . . Treatments need to take advantage of opportunities to improve habitat conditions beyond "natural conditions." For example, exceeding "natural levels" of CWD within a 35-year-old stand can substantially improve the utility of theses stands for late-successional forest-related species. Treatments must take advantage of opportunities to optimize habitat for late-successional forest-related species in the short term. . . .

. . . Within the limits dictated by acceptable fire risk, CWD objectives should be based on research that shows optimum levels of habitat for late successional forest related-species. And not be based simply on measurements within "natural stands." For example, recent research by Casey and Johnson in young stands on the westside indicates owl prey base increases as CWD (over 4") within Douglas-fir forests increases, up to 8- to 10-percent groundcover south of the town of Drain, Oregon . . .

Estimating Cubic Foot Volumes

The accepted method of estimating cubic foot volume of a tree is to sum the estimate volumes for each log in the tree. Attempts to derive a formula for estimating cubic foot volume of an entire tree have not been satisfactory. However as a rule-of-thumb, one half the dbh squared [$(dbh/2)^2$] gives a rough estimate of the cubic foot volume in

a second growth Douglas-fir (Dilworth 1976 pg. 173) and may be useful for estimating cubic foot of CWD in the field and for developing CWD recruitment recommendations while on the project area.

Transects in Candidate Thinning/ Density Management Units
Coarse wood debris (CWD) levels have been measured by the District forestry group on 19 stands in the North Fork Coquille Watershed. These stands were selected based on their potential to support a viable thinning or density management project and the transects were run, in conjunction with the stand exams. The stand exam and transect procedures used are in the H-5250-1 Forest Survey Handbook - BLM Manual Supplement State Office Rel. 5-244. Those results are summarized in Table CWD-2. The transect data were compared with amounts of CWD Spies and Franklin (1991) observed in natural stands, which is shown in Table CWD-1. The two data sets should be compared with each other with caution because the minimum piece size measured in the transects is larger than those counted by Spies and Franklin (1991) in their study (5 inches by 8 feet vs. 4 inches with no minimum length). Also, although Spies and Franklin measured logs in all decay classes, they only included the total volume for all decay classes, and the volume of decay class II logs in their paper.

The results of transect surveys which are summarized in Table CWD-2. The volume of decay class II CWD and the total CWD volume for decay classes I through V on each of the 19 candidate thinning/ density management units are compared to the ranges of volume in natural stands observed in young, mature, and old-growth stands by Spies and Franklin (1991) in Table CWD-3. Also included in Table CWD-3, is a comparison of transect survey results with range of total CWD volume observed in streams and riparian areas by Ursitti (1990) and with decay class I & II recommendations found in this document. Data on larger decay class I and II logs $\geq$16 inches diameter and $\geq$16 feet long, collected during transect surveys, are included in Table CWD-3. Those data are compared to the ROD/RMP management direction for Matrix land, to retain 120 linear feet of logs per acre, with bark intact, following harvest activities (USDI 1994). All but one of the 19 units currently contain less than this minimum amount of CWD of this size.

Observed total CWD volumes for all decay classes is below the typical range for young stands in 13 of the 19 candidate units surveyed. Past fires set either to improve grazing on valley side slopes or escaped land clearing fires may be a factor leading to the low levels of CWD in 6 units. Five of the six units, where CWD levels meet or exceed levels observed in natural young stands, are in parts of the Watershed that were less likely to have been burned by range improvement or escaped land clearing fires. Also these units benefitted from the past logging practices of leaving large cull logs and seed trees in the units.

Comparison with CWD Transects Completed in the South Fork Coos Watershed:
CWD transects were done on 22 stands that are less than 40-years old in the South Fork Coos Watershed (USDI 2000). All 22 regenerated following logging. Sixteen had decay class II CWD amounts that are within or exceed the range documented for 40 to 80-year old natural stands by Spies and Franklin (1991). Eighteen stands had total CWD amounts that are within or exceed the range documented for 40 to 80-year old natural stands.

CWD transects were also completed on fourteen, 40-year old and older stands. Ten of those 14 stands are of natural origin. Two of the 4 stands that regenerated following logging have total CWD levels that within or exceed the range of CWD observed by Spies and Franklin in natural stands. Ten out of 14 units surveyed for CWD, which were 40-years old or older, had decay class II levels that were within or exceeded the natural range documented by Spies and Franklin for 40 to 80-year old natural stands. Five out of 14 units surveyed had total CWD amounts that were within or exceeded the natural range documented by Spies and Franklin.

The South Fork Coos units were a combination of natural stands and stands regenerated immediately following logging. In contrast, several North Fork Coquille stands were logging in the first half of the 20th century and reforestation on those sites was delayed by grazing, and likely by range improvement and escaped land clearing fires.

Spies *et al.* (1988) in their paper on CWD offered an explanation why the transact data show more CWD in the young managed stands that had been logged 29 to 35-years before than either Spies *et al.* (1988) or Spies and Franklin (1991) found in old-growth stands or young natural stands: Wild stands do not necessarily regenerate immediately after a stand replacement fire. Regeneration lags of 20-years to more than 100-years are not unusual. This means under natural conditions, CWD volumes recruited by a stand replacing fire are subject to losses due to

decay, weathering, and possibly reburns for 20 to 100 years before a replacement stand is established. This becomes evident when one compares published volumes for CWD in young natural stands to CWD volumes in old-growth stands. This comparison will show a volume wood, which is somewhat larger than the total standing green volume of an old-growth stand, is lost between the time a stand replacement fire kills an old-growth stand and when the replacement natural stand reaches 40 to 80 years old (Spies *et al.*1988; Spies and Franklin 1991).

Table CWD-1: Down Woody Debris Volumes in Natural Young, Mature, and Old-Growth Douglas-fir Forests in Oregon and Washington from Spies; Franklin (1991)

	young stands: 40 to 80-years old	mature stands: 80 to 195-years old	old-growth stands: >195-years old
Decay class 2: average cubic meters/ hectare	2.0	8.3	16
Decay class 2: 95% confidence limits of the mean expressed in cubic meters/ hectare	0.9 to 4.5	3.9 to 17.8	9.6 to 26.9
Decay class 2: average cubic feet/ acre	28.6	118.7	228.8
Decay class 2: 95% confidence limits of the mean expressed in cubic feet/ acre	12.9 to 64.4	55.8 to 254.5	137.3 to 384.7
Log volume: average cubic meters/ hectare	223	124	266
Log volume: 95% confidence limits of the mean expressed in cubic meters/ hectare	163 to 305	93 to 165	219 to 324
Log volume: average cubic feet/ acre	3188.9	1773.2	3803.8
Log volume: 95% confidence limits of the mean expressed in cubic feet/ acre	2330.9 to 4361.5	1329.9 to 2359.5	3131.7 to 4633.2

Notes: The volumes include all woody debris 4 inches in diameter and larger as measured on the large end.
Conversion factor: 1cubic meter/ hectare = 35.3 cubic feet /2.471 acres or 14.3 cubic feet / acre

Table CWD-2: Coarse Woody Debris Amounts Measured in Candidate Thinning and Density Management Units in the North Fork Coquille Watershed

Unit	CWD length in ft.	tons/ ac (calc. oven dry weight) conifer sp.5 in. dia.+							cubic ft/ ac conifer sp. 5 in dia.+					
		DC.1	DC.2	DC.3	DC.4	DC.5	% DC 4&5*	all DC.	DC.1	DC.2	DC.3	DC.4	DC.5	all DC
sect. 9, T27S, R11W, Mast Creek, Unit 3, 40-60 yrs old (26 transects for a total length of 2600 ft.)	8 - 15	0	0.1	1.8	3.9	0		5.8	0	6	176	378	0	560
	16 +	0	1.2	3.8	19.8	0		24.8	0	92	350	1965	0	2407
	all: 8+	0	1.3	5.6	23.7	0	77%	30.6	0	98	526	2343	0	2967
sect.16, T27S, R11W, Mast Creek, Unit 4, 60 yrs old (29 transects for a total length of 2900 ft.)	8 - 15	0	0.2	0.1	3.2	0		3.5	0	17	8	308	0	333
	16 +	0.3	0.9	1.8	2.2	0		5.2	20	98	161	244	0	523
	all: 8+	0.3	1.1	1.9	5.4	0	62%	8.7	20	115	169	552	0	856
sect. 17, T27S, R11W, Hudson 17, Unit 1 40-60 yrs old, (34 transects for a total length of 3400 ft.)	8 - 15	.4	0	0.8	2.2	0.3		3.7	64	3	75	224	26	392
	16 +	.5	1.9	16.9	21.5	0		40.8	33	174	1555	2222	109	4093
	all: 8+	0.9	1.9	17.7	23.7	0.3	54%	44.5	97	177	1630	2446	135	4485
sect. 19, T27S, R11W, Unit 241485 (80 acres) 60 yrs old, (22 transects for a total length of 2200 ft.)	8 - 15	0	0.4	0	4.5	7.3		12.2	0	30	0	412	768	1210
	16 +	0.3	4.0	3.6	8.4	6.4		22.7	25	347	320	787	616	2095
	all: 8+	0.3	4.4	3.6	12.9	13.7	76%	34.9	25	377	320	1199	1384	3305
sect. 21, T27S, R11W, Unit 241494 (75 acres) 70 yrs old, (20 transects for a total length of 2000 ft.)	8 - 15	0	0	1.2	2.7	5.4		9.3	0	0	105	296	596	997
	16 +	0.1	0.1	5.3	2.6	.3		8.4	19	7	441	267	39	773
	all: 8+	0.1	0.1	6.5	5.3	5.7	62%	17.7	19	7	546	563	635	1770
sect. 21, T27S, R11W, Unit 241494 (120 acres) 70 yrs old, (24 transects for a total length of 2400 ft.)	8 - 15	0	0	0.9	1.4	4.0		6.3	0	3	70	165	448	686
	16 +	0.4	0.6	7.0	9.5	3.0		20.5	23	68	541	917	261	1810
	all: 8+	0.4	0.6	7.9	10.9	7	67%	26.8	23	71	611	1082	709	2496
sect. 29, T27S, R11W, Unit 241505 (420 acres) 60 yrs old, (75 transects for a total length of 7500 ft.)	8 - 15	0	0.1	.2	6.4	2.6		9.3	0	7	19	690	284	1000
	16 +	0	0.6	1.2	15.8	2.2		19.8	0	37	105	1669	236	2047
	all: 8+	0	0.7	1.4	22.2	4.8	93%	29.1	0	44	124	2359	520	3047

Unit	CWD length in ft.	tons/ ac (calc. oven dry weight) conifer sp.5 in. dia.+							cubic ft/ ac conifer sp. 5 in dia.+					
		DC.1	DC.2	DC.3	DC.4	DC.5	% DC 4&5*	all DC.	DC.1	DC.2	DC.3	DC.4	DC.5	all DC
sect. 31, T27S, R11W, Jerusalem Creek, Unit 10 (140 acres) 50 yrs old, (28 transects for a total length of 2800 ft.)	8 - 15	0	0.1	0	.8	2.9		3.8	0	5	0	86	307	398
	16 +	0	0.5	.2	3.7	2.0		6.4	4	47	22	417	190	680
	all: 8+	0	0.6	0.2	4.5	4.9	92%	10.2	4	52	22	503	497	1078
sect. 31, T27S, R11W, Jerusalem Creek, Unit 8 (170 acres) 50 yrs old, (34 transects for a total length of 3400 ft.)	8 - 15	0	0.2	1.0	2.1	0		3.3	0	13	90	218	0	321
	16 +	0.3	0.5	1.4	9.0	0		11.2	25	54	129	918	0	1126
	all: 8+	0.3	0.7	2.4	11.1	0	77%	14.5	25	67	219	1136	0	1447
sect. 31, T27S, R11W, Jerusalem Creek, Unit 11 (125 acres) 50 yrs old, (25 transects for a total length of 2500 ft.)	8 - 15	0	0.2	0.8	0.1	0.7		1.8	0	19	86	9	67	181
	16 +	0.3	0.7	1.8	5.1	2.8		10.7	33	67	184	521	332	1137
	all: 8+	0.3	0.9	2.6	5.2	3.5	70%	12.5	33	86	270	530	399	1318
sect. 31, T27S, R11W, Jerusalem Creek, Unit 9 (170 acres) 40 yrs old, (40 transects for a total length of 4000 ft.)	8 - 15	0	0.1	.3	1.1	3.5		5	0	6	26	113	433	578
	16 +	0.1	0.9	0.1	4.0	7.5		12.6	20	59	10	383	763	1235
	all: 8+	0.1	1	0.4	5.1	11	91%	17.6	20	65	36	496	1196	1813
sect. 33, T27S, R11W, McKinley Garage Unit 13 (220 acres) 37-43 yrs old, (44 transects for a total length of 4400 ft.)	8 - 15	0.1	0	0.1	1.0	2.1		3.3	4	3	17	83	229	336
	16 +	1.0	1.0	4.8	8.4	2.0		17.2	56	71	371	1006	254	1758
	all: 8+	1.1	1	4.9	9.4	4.1	66%	20.5	60	74	388	1089	483	2094
sect. 13, T27S, R12W, Evans-Fairview, Unit 1 (390acres) 40-70 yrs old, (74 transects for a total length of 7400 ft.)	8 - 15	0	0.1	0.3	1.8	0		2.2	0	9	30	181	0	220
	16 +	0.4	1.4	3.2	7.4	0		12.4	30	116	293	778	3	1220
	all: 8+	0.4	1.5	3.5	9.2	0	63%	14.6	30	125	323	959	3	1440
sect. 15, T27S, R12W, Unit 241571 (500 acres) 38-60 yrs old, (137 transects for a total length of 13700 ft.)	8 - 15	0	0	0.1	1.5	0.2		1.8	0	0	7	172	12	191
	16 +	0	0.1	4.0	14.8	0.8		19.7	0	14	3421	1631	84	5150
	all: 8+	0	0.1	4.1	16.3	1	80%	21.5	0	14	3428	1803	96	5341
sect. 23, T27S, R12W, Unit 241585 (280 acres) 38-40 yrs old, (35 transects for a total length of 3500 ft.)	8 - 15	0	0	0	1.4	.1		1.5	0	0	0	131	15	146
	16 +	0.4	0.4	1.7	7.4	2.2		12.1	35	25	226	811	232	1329
	all: 8+	0.4	0.4	1.7	8.8	2.3	82%	13.6	35	25	226	942	247	1475
sect. 25, T27S, R12W, North Fork Coquille Unit 5 (38 acres) 80 yrs old, (5 transects for a total length of 500 ft.)	8 - 15	0	0	0	0	0		0	0	0	0	0	0	0
	16 +	0.6	5.9	2.0	0	0		8.5	47	306	224	0	0	577
	all: 8+	0.6	5.9	2	0	0	0%	8.5	47	306	224	0	0	577
sect. 25, T27S, R12W, North Fork Coquille Unit 6 (33 acres) 39 yrs old, (5 transects for a total length of 500 ft.	8 - 15	0	0	0	0	0		0	0	0	0	0	0	0
	16 +	0	0.3	0	3.9	0		4.2	0	28	0	462	0	490
	all: 8+	0	0.3	0	3.9	0	93%	4.2	0	28	0	462	0	490
sect. 25, T27S, R12W, North Fork Coquille Unit 7 (280 acres) 39-60 yrs, (43 transects for a total length of 4300 ft.	8 - 15	0	0.1	0.3	2.5	1.3		4.2	0	0.5	25	215	133	373.5
	16 +	0.2	1.3	2.2	7.1	2.4		13.2	20	128	181	757	292	1378
	all: 8+	0.2	1.4	2.5	9.6	3.7	76%	17.4	20	128.5	206	972	425	1752
sect. 27, T27S, R12W, Units 241596+241597 (200 acres) 40-60 yrs, (37 transects for a total length of 3700 ft.	8 - 15	0	0	0.1	0.6	0.2		0.9	0	3	8	64	20	95
	16 +	0	0.8	2.2	7.5	0.6		11.1	4	45	205	778	88	1120
	all: 8+	0	0.8	2.3	8.1	0.8	74%	12	4	48	213	842	108	1215

Table CWD-3: Summary of Conifer Coarse Woody Debris Transects for Potential Timber Sale Units in the North Fork Coquille Watershed.

Notes: CWD ≥ 5 inch diameter, and ≥ 8-feet long was measured in transects. Ursitti (1990) measured all CWD ≥ 4 inch diameter and >1-meter long. Spies and Franklin (1991) measured all CWD ≥ 4 inches in diameter. Ages in the table are age at breast height (4.5 ft. above the ground).

Location Age Transects/length	Observed DC 2 CWD volume relative to natural range for DC 2 CWD observed by Spies and Franklin (1991)			Observed total CWD volume relative to natural range for total CWD observed by Spies and Franklin (1991)			DC 1&2 ≥ 16 in. dia. and ≥ 16 ft. long		Total CWD volume relative to CWD recommendations in LSR Assessment (USDI; USDA1998) and DC 1&2 Recommendation (this document)		
	Young stands (40-80 yrs. old)	Mature stands (80-195 yrs. old)	Old-growth (>195 yrs. old)	Young stands (40-80 yrs. old)	Mature stands (80-195 yrs. old)	Old-growth (>195 yrs. old)	Pieces/ acre	Lineal ft./acre	1600-2300 cubic ft./ac.	3600-9400 cubic ft./ac.	147-385 cubic ft./ ac DC 1&2
Sect. 9, T27S, R11W, Mast Creek, Unit 3, 40-60 yrs old (26 transects for a total length of 2600 ft.)	exceeds	within	below	within	exceeds	below	1.1	26.3	exceeds	below	below
Sect.16, T27S, R11W, Mast Creek, Unit 4, 60 yrs old (29 transects for a total length of 2900 ft.)	exceeds	within	below	below	below	below	0.6	47.2	below	below	below
Sect. 17, T27S, R11W, Hudson 17, Unit 1, 40-60 yrs old, (34 transects for a total length of 3400 ft.)	exceeds	within	within	exceeds	exceeds	within	1.7	40.2	exceeds	within	within
Sect. 19, T27S, R11W, Unit 241485 (80 acs), 60 yrs old, (22 transects for a total length of 2200 ft.)	exceeds	exceeds	within	within	exceeds	within	1.3	62.2	exceeds	below	within
Sect. 21, T27S, R11W, Unit 241494 (75 acs), 70 yrs old, (20 transects for a total length of 2000 ft.)	below	below	below	below	within	below	0.0	0.0	within	below	below
Sect. 21, T27S, R11W, Unit 241494 (120 acs), 70 yrs old, (24 transects for a total length of 2400 ft.)	exceeds	within	below	within	exceeds	below	0.7	57.0	exceeds	below	below
Sect. 29, T27S, R11W, Unit 241505 (420 acres), 60 yrs old, (PCTed 1962) (75 transects for a total length of 7500 ft.)	within	below	below	within	exceeds	below	0.1	9.1	exceeds	below	below
Sect. 31, T27S, R11W, Jerusalem Ck., Unit 10 (140 acs), 50 yrs old, (28 transects for a total length of 2800 ft.)	within	below	below	below	below	below	0.0	0.0	below	below	below
Sect. 31, T27S, R11W, Jerusalem Ck., Unit 8 (170 acs) 50 yrs old, (34 transects for a total length of 3400 ft.)	exceeds	within	below	below	below	below	0.0	0.0	below	below	below
Sect. 31, T27S, R11W, Jerusalem Creek, Unit 11 (125 acs), 50 yrs old, (25 transects for a total length of 2500 ft.)	exceeds	within	below	below	below	below	0.5	27.4	below	below	below
Sect. 31, T27S, R11W, Jerusalem Ck., Unit 9 (170 acs), 40 yrs old, (40 transects for a total length of 4000 ft.)	exceeds	within	below	below	within	below	0.2	17.1	within	below	below

Table CWD-3: Summary of Conifer Coarse Woody Debris Transects for Potential Timber Sale Units in the North Fork Coquille Watershed.

Notes: CWD ≥ 5 inch diameter, and ≥ 8-feet long was measured in transects. Ursitti (1990) measured all CWD ≥ 4 inch diameter and >1-meter long. Spies and Franklin (1991) measured all CWD ≥ 4 inches in diameter. Ages in the table are age at breast height (4.5 ft. above the ground).

Location Age Transects/length	Observed DC 2 CWD volume relative to natural range for DC 2 CWD observed by Spies and Franklin (1991)			Observed total CWD volume relative to natural range for total CWD observed by Spies and Franklin (1991)			DC 1&2 ≥ 16 in. dia. and ≥ 16 ft. long		Total CWD volume relative to CWD recommendations in LSR Assessment (USDI; USDA1998) and DC 1&2 Recommendation (this document)		
	Young stands (40-80 yrs. old)	Mature stands (80-195 yrs. old)	Old-growth (>195 yrs. old)	Young stands (40-80 yrs. old)	Mature stands (80-195 yrs. old)	Old-growth (>195 yrs. old)	Pieces/ acre	Lineal ft./acre	1600-2300 cubic ft./ac.	3600-9400 cubic ft./ac.	147-385 cubic ft./ ac DC 1&2
Sect. 33, T27S, R11W, McKinley Garage Unit 13 (220 acs), 37-43 yrs old, (44 transects for a total length of 4,400 ft.)	exceeds	within	below	below	within	below	0.9	62.2	within	below	below
Sect. 13, T27S, R12W, Evans-Fairview, Unit 1 (390 acs), 40-70 yrs old, (74 transects for a total length of 7,400 ft.) Grazed?	exceeds	within	below	below	within	below	1.1	55.5	below	below	below
Sect. 15, T27S, R12W, Unit 241571 (500 acs.), 38-60 yrs old, (137 transects for a total length of 13,700 ft.) Grazed?	within	below	below	exceeds	exceeds	exceeds	0.0	0.0	exceeds	within	below
Sect. 23, T27S, R12W, Unit 241585 (280 acs.), 38-40 yrs old, (35 transects for a total length of 3500 ft.) Grazed?	within	below	below	below	within	below	0.0	0.0	below	below	below
Sect. 25, T27S, R12W, North Fk. Coquille Unit 5 (38 acs), 80 yrs old, (5 transects for a total length of 500 ft.) Grazed?	exceeds	exceeds	within	below	below	below	1.1	136.8	below	below	within
Sect. 25, T27S, R12W, North Fk. Coquille Unit 6 (33 acs), 39 yrs old, (5 transects for a total length of 500 ft.) Grazed?	within	below	below	below	below	below	0.0	0.0	below	below	below
Sect. 25, T27S, R12W, North Fk. Coquille Unit 7 (280 acs), 39-60 yrs old, (43 transects for a total of 4,300 ft.) Grazed?	exceeds	within	below	below	within	below	0.7	47.7	within	below	below
Sect. 27, T27S, R12W, Units 241596+241597 (200 acs), 40-60 yrs old, (37 transects for a total of 3,700 ft.) Grazed?	within	below	below	below	below	below	0.1	18.5	below	below	below
total exceeds	12	2	0	2	6	1			6	0	0
total within	6	10	3	4	6	2			4	2	3
total below	1	7	16	13	7	16			9	17	16
unweighted average							0.5	32.0			

References

ODF. Forest Practices Field Guide, Feb. 27, 1998.

Spies, T.A.; Franklin, J.F.; Thomas, T.B. 1988. *Coarse Woody Debris in Douglas-fir Forests of Western Oregon and Washington*. USDA FS PNW, Corvallis, OR and Univ. of Wash, College of Forest Resources, Seattle, WA.

Spies, T.A.; Franklin, J.F. 1991. *The Structure of Natural Young, Mature, and Old-Growth Douglas-fir Forests in Oregon and Washington*, in Wildlife and Vegetation of Unmanaged Douglas-fir Forest. Gen Tech Rpt PNW-GTR-285. USDA, FS PNW Res Stat, Portland, OR.

USDA. 1991. FSH 2409.11a - Cubic Scaling Handbook, Amendment No. 2409.11a-91-1 effective May 22, 1991. FS Handbook, Washington.

USDI. 1995. *Coos Bay District Record of Decision and Resource Management Plan*. Coos Bay Dist-BLM. North Bend, OR.

WL Appendix-C: Snag Management on Matrix Land

Introduction:
This analysis is concerned only with how to meet the District ROD/RMP management direction to provide snag habitat on the Matrix land. This section will not examine the role of snag habitat, nor will it cover how to maximize or optimize snag habitat. Readers interested in those areas should consult the snag chapter in Brown (1985) for a general survey on snags as habitat, Huff and Raley (1991) on optimizing snag habitat, Peet and Christensen (1987) on tree mortality/ snag recruitment, and Hutto (1995)on snag patches as landscape features.

The Management Direction:
The Forest Plan (USDA; USDI 1994 page C-42) standards and guidelines for managing snag habitat on Matrix Land are:

As a minimum, snags are to be retained within the harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels based on published guidelines and models. The objective is to meet the 40 percent minimum standard throughout the matrix, with per-acre requirements met on average areas no larger than 40 acres. To the extent possible, snag management within harvest units should occur within the areas of green tree retention. The needs of bats should also be considered in these standards and guidelines as those needs become better known. Snag recruitment trees left to meet an identified, near-term (less than 3 decades) snag deficit do not count toward green-tree retention requirements.

The District ROD/RMP (USDI 1995 pages 22, 27, 28, 53 and 54) contains the following management actions and direction for providing snag habitat on Matrix land:

Retain snags within a timber harvest unit at levels sufficient to support species of cavity nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per acre requirements met on average areas no larger than 40 acres.

In addition to the green tree retention management action/ direction, retain green trees for snag recruitment in timber harvest units where there is an identified, near-term (less than 3 decades) snag deficit. These trees do not count toward green-tree retention requirements.

Snag Habitat Quantity and Quality needed to Support 40% of Potential Population Levels:
Table Snag-1 shows the snag nesting habitat minimum requirements for the species of primary excavator birds found in the North Fork Coquille Watershed

Table Snag-1: Snag Requirements for Nesting and Roosting for the Primary Excavators Found in the North Fork Coquille Watershed

Bird Species	Minimum Snag DBH (with bark) usable by the species	Snag Decay Class usable by the bird species for nesting habitat	
		Hard Snags (decay classes 2-3)	Soft Snags (decay classes 4-5)
Downy woodpecker	11+	X	X
Red-breasted sapsucker	15+	X	
Hairy woodpecker	15+	X	
Northern flicker	17+	X	X
Red-breasted nuthatch	17+	X	
Pileated woodpecker	25+	X	

The data in Table Snag-2 are output from Marcot model and show the number of snags by size and decay class to meet the 40%, 60% and 100% nesting habitat needs for the primary excavator species in the North Fork Coquille Watershed.

Table Snag-2: The Number of Snags Needed to Support 100%, 60%, and 40% Population Levels of Primary Excavators in a Forested Habitat in the North Fork Coquille Watershed (from the Marcot snag model)

	Snag outside bark DBH class (inches)	Number of Snags/ 100 acres by decay class		Total snags/ 100 acres	Total snags/ 40 acres	Total snags/ 1 acre
		Hard snags (decay classes 2-3)	Soft snags (decay classes 4-5)			
Number of snags needed to support a 100% population	11+	8	8	16	6.4	0.16
	15+	237	0	237	94.8	2.37
	17+	100	24	124	49.6	1.24
	25+	6	0	6	2.4	0.06
	Totals:	**351**	**32**	**383**	**153.2**	**3.83**
Number of snags needed to support a 60% population	11+	5	5	10	4.0	0.10
	15+	142	0	142	56.8	1.42
	17+	60	15	75	30.0	0.75
	25+	4	0	4	1.6	0.04
	Totals:	**211**	**20**	**231**	**92.4**	**2.31**
Number of snags needed to support a 40% population	11+	3	3	6	2.4	0.06
	15+	95	0	95	38.0	0.95
	17+	40	10	50	20.0	0.50
	25+	2	0	2	0.8	0.02
	Totals:	**140**	**13**	**153**	**61.2**	**1.53**

Hard Snag Longevity and Providing Snag Habitat in the Near Term (defined as 3 decades):
As shown in the preceding two tables, the primary excavator birds have minimum snag diameter and state of decay requirements that must be meet in addition to numbers of snags on the landscape. For example, retaining 3 or 4 or more snags per acre following a timber harvest would not meet the 40% population objective if all those snags were decay class 4 or 5. A snag's decay class is not a static condition. As shown in the next two tables below, leaving 1.5 hard snags/ acre, without making provisions for additional snag recruitment, will not necessarily meet the ROD/RMP management actions and direction to provide the prescribed levels of snag habitat for the "near-term (less than 3 decades)." This is because the hard snags smaller than 18.8-inches dbh will transition to soft snags before the new stand can produce replacement snags meeting the minimum size required by most of the primary excavator species (see Tables Snag-3 and Snag-4).

Table Snag-3: Estimated Age When Douglas-fir Snags Reach a Deterioration State
(Adapted from Brown 1985 pg. 136, which in turn was adapted from Cline et al. 1980.)

snag size	decay class1	decay class2	decay class 3	decay class 4	decay class 5
3.6-7.2 inch dbh	0-4	5-8	9-16	17	fallen
7.6-18.8 inch dbh	0-5	6-13	14-29	30-60	>60
>18.8 inch dbh	0-6	7-18	19-50	51-125	>125

Table Snag-4: The Expected Time that Hard Snags Retained on a Regeneration Harvest Unit Will Provide Hard Snag Habitat

snag size and decay class when regeneration unit is cut	number of years snag will be a hard snag	Replacement snag needed to meet the RMP short term (30-yr) objective	Discussion
3.6-7.2 inch dbh - decay class1	12 to 16	N/A	Too small to provide nesting habitat
3.6-7.2 inch dbh - decay class2	8 to 11	N/A	Too small to provide nesting habitat
3.6-7.2 inch dbh - decay class 3	1 to 7	N/A	Too small to provide nesting habitat
7.6-18.8 inch dbh - decay class1	24 to 29	no, if original snag is 11-inches yes, if the needs of the excavator species that can use 11-inch hard snags are already met.	New stand potentially can provide 11-inch dbh snags to replace the old snags that transition to decay class 4. New stand will not likely provide either the 15inch + or 17 inch + replacement snags.
7.6-18.8 inch dbh - decay class2	16 to 23	yes	Snag recruitment needed 15 to 20 years after the regeneration cut is completed to meet the RMP direction to provide snag habitat in the near term (30-yr).
7.6-18.8 inch dbh - decay class 3	1 to 15	yes	Replacement snag needed within first 15-years after regeneration cut.
>18.8 inch dbh - decay class1	46 to 50	no	
>18.8 inch dbh - decay class2	32 to 44	no	
>18.8 inch dbh - decay class 3	1 to 31	yes	Unless the decay class 3 snags left after the regeneration cut had just transitioned from decay class 2, replacement snags will be needed to meet the RMP direction to provide snag habitat in the near term (30-yr).

Most large (≥18.8-inch) decay class 3 snags will transition to a decay class 4 before the new stand can produce replacement small snags. If we are to meet the ROD/RMP management actions/ direction, then we do one of the following:

- Meet the hard snag component of 1.5 snag/ acre requirement with decay class 1 and 2 snags that are more than 18.8-inches in diameter.
- Or retain additional green trees to be turned into new snags to replace those hard snags that are between 15 and 18.8-inches dbh, and to replace the large decay class 3 snags when they transition to soft snags.
- Or the adjacent stands in the ROD/RMP prescribed 40-acre Matrix land neighborhood must consistently provide a minimum of 56 hard snags and 5.2 soft snags (61.2 total) during the 3 decades following the timber harvest.

The limited time a snag provides hard snag habitat for primary excavators means that many smaller hard snags, and several large decay class 3 snags, left on timber sale units in the early 1980's, are now or soon will be soft snags. Table Snag-5 shows the stand age when the average new mortality meets or exceeds the minimum snag diameter used by a range of primary excavator species for a range of sites and management conditions(adapted from Table DM-1):

Table Snag-5: Stand Age When the Average New Mortality Meets or Exceeds the Minimum Snag Diameter Used by a Range of Primary Excavator Species

Snag dbh	SI 115, 291 trees/ ac at age 32			SI 127, 259 trees/ac at age 31		
	unthinned stand	Stand thinned to 120 trees/ ac at age 40-yrs	Stand thinned to 60 trees/ ac at age 40-yrs	unthinned stand	Stand thinned to 120 trees/ ac at age 40-yrs	Stand thinned to 60 trees/ ac at age 40-yrs
11-inches +	60-yr old	50-yr old	50-yr old	40-yr old	40-yr old	40-yr old
15-inches +	100-yr old	60-yr old	50-yr old	70-yr old	50-yr old	50-yr old
17-inches +	120-yr old	70-yr old	50-yr old	80-yr old	50-yr old	50-yr old
25-inches +	>200-yr old	>200-yr old	not determined	200-yr old	170-yr old	90-yr old

Meeting the 40 % Minimum Throughout the Matrix with the per Acre Requirements Met on Average Areas No Larger than 40 Acres:

The ROD/RMP language concerning snag management on Matrix land suggests that the 40% level/ 40 acre neighborhood applies to Matrix land with no provision to count snags in the LSR or Riparian Reserve toward meeting the Matrix snag actions direction. This is emphasized by the language in the Forest Plan to meet the 40 % minimum standard throughout the Matrix, with per-acre requirements met on average areas no larger than 40 acres.

The Matrix land in the North Fork Coquille Watershed contains 9,799 acres of GFMA and 361 acres of Connectivity (Table Intro-2). Of this, 3,993 acres in the GFMA support stands that are 60-years old or older. These acres, excluding those sites taken out of the timber base due to a nonsuitable classification in TPCC, are available for regeneration harvest pending the results of surveys for survey and manage species and marbled murrelets.

Table Snag-5 suggests that 50-year old and younger second growth stands will not reliably provide hard snags except on the better sites and in thinned stands. The hard snags in these young stands will only provide suitable nesting habitat for the smaller excavator species. This further suggests that the BLM may have to retain or recruit large hard snags in addition to the minimum 1.5 snags/ acre, on those regeneration units next to second growth stands, to meet the 40% minimum snag levels throughout the Matrix. The numbers of additional snags that need to be retained or created are shown in Table Snag-6.

Table Snag-6: Snag Retention Levels Needed to Meet the 40% Snag Levels in the 40-acre Neighborhood Management Objective

Regeneration unit size	Area outside the regeneration unit but inside the 40-acre neighborhood	Total number of snags needed to meet the 40% snag level in the 40-acre neighborhood	Snags/ acre needed on the regeneration unit, following harvest, if there are no suitable snags in the 40-acre neighborhood outside the regeneration unit.
40-acres	0	61.2	1.53
30-acres	10-acres	61.2	2.04
20-acres	20-acres	61.2	3.06
16-acres	24-acres	61.2	3.8
<16-acres	>24-acres	Increasing snag densities to greater than 3.8 snags/ acre inside the regeneration unit boundary may not result in greater primary cavity excavator bird numbers. This is because territory size or other factors may become more limiting than snag numbers. Therefore, when the regeneration unit is less than 16-acres, ID teams should establish snag retention levels based on an estimate of the number of primary excavator birds that can occupy the 40-acre neighborhood.	

References:

Brown, E.R., tech. ed. 1985. *Management of Wildlife and Fish Habitats in Forest of Western Oregon and Washington. Part 1–Chapter Narratives*, 332 pg. Part 2–Appendices, 302pg. Publ. R6 & WL-192-1985. Portland, OR: USDA, FS, PNW Region.

Cline, S.P.; Berg, A.B.; Wight, H.M. 1980. *Snag Characteristics and Dynamics in Douglas-fir Forests, Western Oregon*. J. Wildl. Manage. 44(4):773-786.

Huff, M.H; Raley, C.M. 1991. *Regional Patterns of Diurnal Breeding Bird Communities in Oregon and Washington* pg. 177-205. in Wildlife and Vegetation of Unmanaged Douglas-fir Forests. Editors: L.F. Ruggiero, K.B. Aubry, A.B Carey, M.H. Huff. USDA, FS PNW Res. Stat.., Portland, OR Gen Tech Rpt PNW-GTR

Hutto, R.L. 1995. *Composition of Bird Communities Following Stand-Replacement Fires in Northern Rocky Mountains (USA) Conifer Forests*. Conservation Biology. 9(5):1041-1058.

Peet, R.K.; Christensen, N.L. 1987. *Competition and Tree Death*. BioScience. 37(8):586-595.

USDA; USDI. 1994 . *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*. FS; BLM, Portland OR.

USDI. 1995. *Coos Bay District Record of Decision and Resource Management Plan, May 1995*. Coos Bay Dist.-BLM, North Bend, OR. 99 pp. plus appendices and maps.

WL Appendix-D: Vertebrate Wildlife Species List for the North Fork Coquille Watershed

The following species list was compiled by wildlife biologists for the Coos Bay District BLM. It is intended to be a comprehensive list of all vertebrate wildlife species known or suspected to utilize the District, and will continue to be updated as new information becomes available. The determination of species presence within the North Fork Coquille watershed was made using a combination of documented sightings, professional knowledge of and review of distribution information found in field guides and the Oregon Natural Heritage Database. The codes used for Presence, Federal Status, and State Status are given below.

[1] Present in North Fork Coquille Watershed

N	-	Not thought to be present within the watershed at any time.
S	-	Suspected to be present within the watershed, but the species has not been documented and local biologists have no direct evidence of presence.
K	-	Known to be present within the watershed through observations by trained biologists, most sightings documented in Resource Area files.
D	-	Species which have been documented present within the watershed.

[2] Status Federal

FE	-	Federally Endangered Species
FT	-	Federally Threatened Species
FC	-	Federal Candidate Species
BS	-	Bureau Sensitive Species
BT	-	Bureau Tracking Species
BA	-	Bureau Assessment Species

[3] Status State

SE	-	State Endangered Species
ST	-	State Threatened Species
SSC	-	State Sensitive- Critical Species
SSV	-	State Sensitive- Vulnerable Species
SSP	-	State Sensitive- Peripheral or Naturally Rare Species
SSU	-	State Sensitive- Undetermined Status Species

[4] Represents some type of change from the published version of Table C-3 of the Coos Bay District Record of Decision and Resource Management Plan (May 1995). Changes are due to administrative and legal changes in species status by federal and state agencies, changes to lists maintained by the Oregon Natural Heritage Program and correction of errors in the published version of Table C-3. Some species gained special status, others no longer have special status, for others it was the level of status that changed, and some were Special Status Species at the time Table C-3 was published, but were mistakenly omitted from it.

[5] Represents change to a common or scientific name for a Special Status Species from the name provided in the published version of Table C-3 of the Coos Bay District Record of Decision and Resource Management Plan (May 1995).

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
AMPHIBIANS				
NORTHWESTERN SALAMANDER	AMBYSTOMA GRACILE	S		
LONG-TOED SALAMANDER	AMBYSTOMA MACRODACTYLUM	S		
PACIFIC GIANT SALAMANDER	DICAMPTODON TENEBROSUS	K		
SOUTHERN TORRENT SALAMANDER	RHYACOTRITON VARIEGATUS	K	BT	SSC[4]
CLOUDED SALAMANDER	ANEIDES FERREUS	S	BT	SSU
CALIFORNIA SLENDER SALAMANDER	BATRACHOSEPS ATTENUATUS	N	BA	SSP
ENSATINA	ENSATINA ESCHSCHOLTZII	S		
DUNN'S SALAMANDER	PLETHODON DUNNI	S		
DEL NORTE SALAMANDER	PLETHODON ELOGATUS	N	BS[4]	SSV
SISKIYOU MOUNTAINS SALAMANDER	PLETHODON STORMI	N	BS[4]	SSV
WESTERN RED-BACKED SALAMANDER	PLETHODON VEHICULUM	K		
ROUGH-SKINNED NEWT	TARICHA GRANULOSA	K		
WESTERN TOAD	BUFO BOREAS	N	BT	SSV
PACIFIC TREEFROG	PSEUDACRIS REGILLA	K		
TAILED FROG	ASCAPHUS TRUEI	K	BA[4]	SSV
RED-LEGGED FROG	RANA AURORA	K	BS[4]	SSU
FOOTHILL YELLOW LEGGED FROG	RANA BOYLII	S	BS[4]	SSV
BULLFROG	RANA CATESBEIANA	S		
SPOTTED FROG	RANA PRETIOSA	N	FC	SSC
REPTILES				
PAINTED TURTLE	CHRYSEMYS PICTA	N	BA[4]	SSC
NORTHWESTERN POND TURTLE[5]	CLEMMYS MARMORATA MARMORATA	S	BS[4]	SSC
LOGGERHEAD SEA TURTLE	CARETTA CARETTA	N	FT[4]	ST
GREEN SEA TURTLE	CHELONIA MYDAS	N	FE	SE
LEATHERBACK SEA TURTLE	DERMOCHELYS CORIACEA	N	FE	SE
PACIFIC RIDLEY SEA TURTLE	LEPIDOCHELYS OLIVACEA	N	FT	ST
NORTHERN ALLIGATOR LIZARD	ELGARIA COERULEA	S		
SOUTHERN ALLIGATOR LIZARD	ELGARIA MULTICARINATA	S		
SAGEBRUSH LIZARD	SCELOPORUS GRACIOSUS	N		
WESTERN FENCE LIZARD	SCELOPORUS OCCIDENTALIS	S		
WESTERN SKINK	EUMECES SKILTONIANUS	S		
RUBBER BOA	CHARINA BOTTAE	S		
RACER	COLUBER CONSTRICTOR	S		
SHARPTAIL SNAKE	CONTIA TENUIS	N	BA[4]	SSV

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
RINGNECK SNAKE	DIADOPHIS PUNCTATUS	S		
COMMON KINGSNAKE	LAMPROPELTIS GETULUS	N	BA[4]	SV[4]
CALIFORNIA MOUNTAIN KINGSNAKE	LAMPROPELTIS ZONATA	N	BA[4]	SSV[4]
GOPHER SNAKE	PITUOPHIS CATENIFER	S		
WESTERN AQUATIC GARTER SNAKE	THAMNOPHIS COUCHI	S		
WESTERN TERRESTRIAL GARTER SNAKE	THAMNOPHIS ELEGANS	S		
NORTHWESTERN GARTER SNAKE	THAMNOPHIS ORDINOIDES	S		
COMMON GARTER SNAKE	THAMNOPHIS SIRTALIS	S		
WESTERN RATTLESNAKE	CROTALUS VIRIDIS	S		
BIRDS				
PACIFIC LOON	GAVIA PACIFICA	N		
COMMON LOON	GAVIA IMMER	N	BA	
YELLOW-BILLED LOON	GAVIA ADAMSII	N		
RED-THROATED LOON	GAVIA STELLATA	N		
PIED-BILLED GREBE	PODILYMBUS PODICEPS	S		
HORNED GREBE	PODICEPS AURITUS	N	4	4
RED-NECKED GREBE	PODICEPS GRISEGENA	N	4	4
EARED GREBE	PODICEPS NIGRICOLLIS	N		
WESTERN GREBE	AECHMOPHORUS OCCIDENTALIS	N		
CLARK'S GREBE	AECHMOPHORUS CLARKII	N		
FORK-TAILED STORM PETREL	OCEANODROMA FURCATA	N	BA	SSV
BROWN PELICAN	PELECANUS OCCIDENTALIS	N	FE	SE
DOUBLE-CRESTED CORMORANT	PHALACROCORAX AURITUS	N		
BRANDT'S CORMORANT	PHALACROCORAX PENICILLATUS	N		
PELAGIC CORMORANT	PHALACROCORAX PELAGICUS	N		
AMERICAN BITTERN	BOTAURUS LENTIGINOSUS	N		
GREAT EGRET	ARDEA ALBA	N	BT	4
SNOWY EGRET	EGRETTA THULA	N	4	4
CATTLE EGRET	BUBULCUS IBIS	N		
GREAT BLUE HERON	ARDEA HERODIAS	D		
GREEN HERON	BUTORIDES VIRESCENS	S		
BLACK-CROWNED NIGHT HERON	NYCTICORAX NYCTICORAX	N		
TUNDRA SWAN	CYGNUS COLUMBIANUS	N		
GREATER WHITE-FRONTED GOOSE	ANSER ALBIFRONS	N		
SNOW GOOSE	CHEN CAERULESCENS	N		
BRANDT	BRANTA BERNICLA	N		

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
CANADA GOOSE	BRANTA CANADENSIS	N		
ALEUTIAN CANADA GOOSE	BRANTA CANADENSIS LEUCOPAREIA	N	FT	SE
CACKLING CANADA GOOSE	BRANTA CANADENSIS MINIMA	N	[4]	
DUSKY CANADA GOOSE	BRANTA CANADENSIS OCCIDENTALIS	N	BA[4]	
WOOD DUCK	AIX SPONSA	S		
GREEN-WINGED TEAL	ANAS CRECCA	S		
MALLARD	ANAS PLATYRHYNCHOS	S		
NORTHERN PINTAIL	ANAS ACUTA	S		
BLUE-WINGED TEAL	ANAS DISCORS	N		
CINNAMON TEAL	ANAS CYANOPTERA	S		
NORTHERN SHOVELER	ANAS CLYPEATA	N		
GADWALL	ANAS STREPERA	N		
EURASIAN WIGEON	ANAS PENELOPE	N		
AMERICAN WIGEON	ANAS AMERICANA	N		
CANVASBACK	AYTHYA VALISINERIA	N		
REDHEAD	AYTHYA AMERICANA	N		
RING-NECKED DUCK	AYTHYA COLLARIS	N	[4]	
GREATER SCAUP	AYTHYA MARILA	N		
LESSER SCAUP	AYTHYA AFFINIS	N	[4]	
COMMON GOLDENEYE	BUCEPHALA CLANGULA	S		
BARROW'S GOLDENEYE	BUCEPHALA ISLANDICA	N		
BUFFLEHEAD	BUCEPHALA ALBEOLA	N	[4]	[4]
HOODED MERGANSER	LOPHODYTES CUCULLATUS	S		
COMMON MERGANSER	MERGUS MERGANSER	S		
RED-BREASTED MERGANSER	MERGUS SERRATOR	S		
RUDDY DUCK	OXYURA JAMAICENSIS	N		
HARLEQUIN DUCK	HISTRIONICUS HISTRIONICUS	N	BS[4]	
OLDSQUAW	CLANGULA HYEMALIS	N		
BLACK SCOTER	MELANITTA NIGRA	N		
SURF SCOTER	MELANITTA PERSPICILLATA	N		
WHITE-WINGED SCOTER	MELANITTA FUSCA	N		
TURKEY VULTURE	CATHARTES AURA	S		
OSPREY	PANDION HALIAETUS	S		
WHITE-TAILED KITE	ELANUS LEUCURUS	N	BT	
BALD EAGLE	HALIAEETUS LEUCOCEPHALUS	K	FT	ST
GOLDEN EAGLE	AQUILA CHRYSAETOS	K		
NORTHERN HARRIER	CIRCUS CYANEUS	N		

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
SHARP-SHINNED HAWK	ACCIPITER STRIATUS	S		
COOPER'S HAWK	ACCIPITER COOPERII	S		
NORTHERN GOSHAWK	ACCIPITER GENTILIS	S	BS[4]	SSC
RED-SHOULDERED HAWK	BUTEO LINEATUS	N		
RED-TAILED HAWK	BUTEO JAMAICENSIS	S		
ROUGH-LEGGED HAWK	BUTEO LAGOPUS	N		
AMERICAN KESTREL	FALCO SPARVERIUS	S		
MERLIN	FALCO COLUMBARIUS	S	BA	
AMERICAN PEREGRINE FALCON[5]	FALCO PEREGRINUS ANATUM[5]	S	BS	SE
GYRFALCON	FALCO RUSTICOLUS	N		
RING-NECKED PHEASANT	PHASIANUS COLCHICUS	N		
BLUE GROUSE	DENDRAGAPUS OBSCURUS	S		
RUFFED GROUSE	BONASA UMBELLUS	S		
WILD TURKEY	MELEAGRIS GALLOPAVO	S		
CALIFORNIA QUAIL	CALLIPEPLA CALIFORNICA	S		
MOUNTAIN QUAIL	OREORTYX PICTUS	S	[4]	
VIRGINIA RAIL	RALLUS LIMICOLA	N		
SORA	PORZANA CAROLINA	N		
AMERICAN COOT	FULICA AMERICANA	S		
BLACK-BELLIED PLOVER	PLUVIALIS SQUATAROLA	N		
AMERICAN GOLDEN PLOVER	PLUVIALIS DOMINICA	N		
PACIFIC GOLDEN PLOVER	PLUVIALIS FULVA	N		
WESTERN SNOWY PLOVER	CHARADRIUS ALEXANDRINUS NIVOSUS	N	FT	ST
SEMIPALMATED PLOVER	CHARADRIUS SEMIPALMATUS	N		
KILLDEER	CHARADRIUS VOCIFERUS	S		
BLACK OYSTERCATCHER	HAEMATOPUS BACHMANI	N		
GREATER YELLOWLEGS	TRINGA MELANOLEUCA	N	BA	
LESSER YELLOWLEGS	TRINGA FLAVIPES	N		
WILLET	CATOPTROPHORUS SEMIPALMATUS	N		
WANDERING TATTLER	HETEROSCELUS INCANUS	N		
WHIMBREL	NUMENIUS PHAEOPUS	N		
LONG-BILLED CURLEW	NUMENIUS AMERICANUS	N	[4]	
BAR-TAILED GODWIT	LIMOSA LAPPONICA	N		
MARBLED GODWIT	LIMOSA FEDOA	N		
RUDDY TURNSTONE	ARENARIA INTERPRES	N		
BLACK TURNSTONE	ARENARIA MELANOCEPHALA	N		
SURFBIRD	APHRIZA VIRGATA	N		

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
RED KNOT	CALIDRIS CANUTUS	N		
SANDERLING	CALIDRIS ALBA	N		
SOLITARY SANDPIPER	TRINGA SOLITARIA	N	BT[4]	
SPOTTED SANDPIPER	ACTITIS MACULARIA	S		
SEMIPALMATED SANDPIPER	CALIDRIS PUSILLA	N		
WESTERN SANDPIPER	CALIDRIS MAURI	N		
LEAST SANDPIPER	CALIDRIS MINUTILLA	N		
BAIRD'S SANDPIPER	CALIDRIS BAIRDII	N		
PECTORAL SANDPIPER	CALIDRIS MELANOTOS	N		
SHARP-TAILED SANDPIPER	CALIDRIS ACUMINATA	N		
ROCK SANDPIPER	CALIDRIS PTILOCNEMIS	N		
STILT SANDPIPER	CALIDRIS HIMANTOPUS	N		
BUFF-BREASTED SANDPIPER	TRYNGITES SUBRUFICOLLIS	N		
DUNLIN	CALIDRIS ALPINA	N		
RUFF	PHILOMACHUS PUGNAX	N		
SHORT-BILLED DOWITCHER	LIMNODROMUS GRISEUS	N		
LONG-BILLED DOWITCHER	LIMNODROMUS SCOLOPACEUS	N		
COMMON SNIPE	GALLINAGO GALLINAGO	S		
WILSON'S PHALAROPE	PHALAROPUS TRICOLOR	N		
RED-NECKED PHALAROPE	PHALAROPUS LOBATUS	N		
RED PHALAROPE	PHALAROPUS FULICARIA	N		
BONAPARTE'S GULL	LARUS PHILADELPHIA	N		
HEERMANN'S GULL	LARUS HEERMANNI	N		
MEW GULL	LARUS CANUS	N		
RING-BILLED GULL	LARUS DELAWARENSIS	N		
CALIFORNIA GULL	LARUS CALIFORNICUS	N		
HERRING GULL	LARUS ARGENTATUS	N		
THAYER'S GULL	LARUS THAYERI	N		
WESTERN GULL	LARUS OCCIDENTALIS	N		
GLAUCOUS-WINGED GULL	LARUS GLAUCESCENS	N		
GLAUCOUS GULL	LARUS HYPERBOREUS	N		
SABINE'S GULL	XEMA SABINI	N		
BLACK-LEGGED KITTIWAKE	RISSA TRIDACTYLA	N		
CASPIAN TERN	STERNA CASPIA	N	BT	
COMMON TERN	STERNA HIRUNDO	N		
ARCTIC TERN	STERNA PARADISAEA	N		
ELEGANT TERN	STERNA ELEGANS	N		

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
COMMON MURRE	URIA AALGE	N		
PIGEON GUILLEMOT	CEPPHUS COLUMBA	N		
MARBLED MURRELET	BRACHYRAMPHUS MARMORATUS MARMORATUS	D	FT	ST[4]
ANCIENT MURRELET	SYNTHLIBORAMPHUS CRAVERI	N		
CASSIN'S AUKLET	PTYCHORAMPHUS ALEUTICUS	N		
RHINOCEROS AUKLET	CERORHINCA MONOCERATA	N		
TUFTED PUFFIN	FRATERCULA CIRRHATA	N		
BAND-TAILED PIGEON	COLUMBA FASCIATA	D		
ROCK DOVE	COLUMBA LIVIA	S		
MOURNING DOVE	ZENAIDA MACROURA	S		
BARN OWL	TYTO ALBA	S		
WESTERN SCREECH-OWL	OTUS KENNICOTTII	D		
GREAT HORNED OWL	BUBO VIRGINIANUS	D		
SNOWY OWL	NYCTEA SCANDIACA	N		
NORTHERN PYGMY-OWL	GLAUCIDIUM GNOMA	D	BT	SSU
BURROWING OWL	ATHENE CUNICULARIA	N	BS	SSC
NORTHERN SPOTTED OWL	STRIX OCCIDENTALIS CAURINA	D	FT	ST
BARRED OWL	STRIX VARIA	S		
SHORT-EARED OWL	ASIO FLAMMEUS	N		
NORTHERN SAW-WHET OWL	AEGOLIUS ACADICUS	D	BA[4]	
COMMON NIGHTHAWK	CHORDEILES MINOR	D		
BLACK SWIFT	CYPSELOIDES NIGER	N		
VAUX'S SWIFT	CHAETURA VAUXI	S		
ANNA'S HUMMINGBIRD	CALYPTE ANNA	S		
RUFOUS HUMMINGBIRD	SELASPHORUS RUFUS	D		
ALLEN'S HUMMINGBIRD	SELASPHORUS SASIN	N	BT[4]	
BELTED KINGFISHER	CERYLE ALCYON	S		
LEWIS' WOODPECKER	MELANERPES LEWIS	N	BA[4]	SSC
ACORN WOODPECKER	MELANERPES FORMICIVORUS	N	BT	[4]
RED-BREASTED SAPSUCKER	SPHYRAPICUS RUBER	S		
DOWNY WOODPECKER	PICOIDES PUBESCENS	S		
HAIRY WOODPECKER	PICOIDES VILLOSUS	D		
BLACK-BACKED WOODPECKER	PICOIDES ARCTICUS	N	BA[4]	SSC
NORTHERN FLICKER	COLAPTES AURATUS	D		
PILEATED WOODPECKER	DRYOCOPUS PILEATUS	D	BA[4]	SSV[4]
OLIVE-SIDED FLYCATCHER	CONTOPUS BOREALIS	S		
WESTERN WOOD-PEWEE	CONTOPUSSORDIDULUS	N		

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
WILLOW FLYCATCHER	EMPIDONAX TRAILLII	S		
HAMMOND'S FLYCATCHER	EMPIDONAX HAMMONDII	D		
DUSKY FLYCATCHER	EMPIDONAX OBERHOLSERI	S		
PACIFIC SLOPE FLYCATCHER	EMPIDONAX DIFFICILIS	D		
BLACK PHOEBE	SAYORNIS NIGRICANS	N	BT	
TROPICAL KINGBIRD	TYRANNUS VOCIFERANS	N		
WESTERN KINGBIRD	TYRANNUS VERTICALIS	S		
HORNED LARK	EREMOPHILA ALPESTRIS	N		
PURPLE MARTIN	PROGNE SUBIS	N	BA[4]	SSC
TREE SWALLOW	TACHYCINETA BICOLOR	S		
VIOLET-GREEN SWALLOW	TACHYCINETA THALASSINA	S		
NORTHERN ROUGH-WINGED SWALLOW	STELGIDOPTERYX SERRIPENNIS	S		
BANK SWALLOW	RIPARIA RIPARIA	N	BT[4]	SSU[4]
CLIFF SWALLOW	HIRUNDO PYRRHONOTA	S		
BARN SWALLOW	HIRUNDO RUSTICA	S		
GRAY JAY	PERISOREUS CANADENSIS	D		
STELLER'S JAY	CYANOCITTA STELLERI	D		
SCRUB JAY	APHELOCOMA CALIFORNICA	S		
AMERICAN CROW	CORVUS BRACHYRHYNCHOS	D		
COMMON RAVEN	CORVUS CORAX	D		
BLACK-CAPPED CHICKADEE	PARUS ATRICAPILLUS	S		
MOUNTAIN CHICKADEE	PARUS GAMBELI	S		
CHESTNUT-BACKED CHICKADEE	PARUS RUFESCENS	D		
BUSHTIT	PSALTRIPARUS MINIMUS	S		
RED-BREASTED NUTHATCH	SITTA CANADENSIS	D		
WHITE-BREASTED NUTHATCH	SITTA CAROLINENSIS	S		
BROWN CREEPER	CERTHIA AMERICANA	D		
BEWICK'S WREN	THRYOMANES BEWICKII	S		
HOUSE WREN	TROGLODYTES AEDON	S		
WINTER WREN	TROGLODYTES TROGLODYTES	D		
MARSH WREN	CISTOTHORUS PALUSTRIS	S		
AMERICAN DIPPER	CINCLUS MEXICANUS	S		
GOLDEN-CROWNED KINGLET	REGULUS SATRAPA	S		
RUBY-CROWNED KINGLET	REGULUS CALENDULA	S		
WESTERN BLUEBIRD	SIALIA MEXICANA	S	BA[4]	SSV
TOWNSEND'S SOLITAIRE	MYADESTES TOWNSENDI	S		
AMERICAN ROBIN	TURDUS MIGRATORIUS	D		

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
SWAINSON'S THRUSH	CATHARUS USTULATUS	D		
HERMIT THRUSH	CATHARUS GUTTATUS	S		
VARIED THRUSH	IXOREUS NAEVIUS	D		
WRENTIT	CHAMAEA FASCIATA	D		
MOCKINGBIRD	MIMUS POLYGLOTTOS	N		
AMERICAN PIPIT	ANTHUS SPINOLETTA	S		
CEDAR WAXWING	BOMBYCILLA CEDRORUM	S		
NORTHERN SHRIKE	LANIUS EXCUBITOR	S		
LOGGERHEAD SHRIKE	LANIUS LUDOVICIANUS	N	BT[4]	[4]
EUROPEAN STARLING	STURNUS VULGARIS	S		
SOLITARY VIREO	VIREO SOLITARIUS	S		
HUTTON'S VIREO	VIREO HUTTONI	S		
WARBLING VIREO	VIREO GILVUS	S		
ORANGE-CROWNED WARBLER	VERMIVORA CELATA	S		
NASHVILLE WARBLER	VERMIVORA RUFICAPILLA	S		
YELLOW WARBLER	DENDROICA PETECHIA	S		
YELLOW-RUMPED WARBLER	DENDROICA CORONATA	S		
BLACK-THROATED GRAY WARBLER	DENDROICA NIGRESCENS	D		
TOWNSEND'S WARBLER	DENDROICA TOWNSENDI	S		
HERMIT WARBLER	DENDROICA OCCIDENTALIS	S		
PALM WARBLER	DENDROICA PALMARUM	N		
BLACK-AND-WHITE WARBLER	MNIOTILTA VARIA	N		
MACGILLIVRAY'S WARBLER	OPORORNIS TOLMIEI	D		
COMMON YELLOWTHROAT	GEOTHLYPIS TRICHAS	S		
WILSON'S WARBLER	WILSONIA PUSILLA	S		
YELLOW-BREASTED CHAT	ICTERIA VIRENS	S		
WESTERN TANAGER	PIRANGA LUDOVICIANA	D		
BLACK-HEADED GROSBEAK	PHEUCTICUS MELANOCEPHALUS	S		
LAZULI BUNTING	PASSERINA AMOENA	S		
RUFOUS-SIDED TOWHEE	PIPILO ERYTHROPHTHALMUS	D		
CHIPPING SPARROW	SPIZELLA PASSERINA	S		
VESPER SPARROW	POOECETES GRAMINEUS	N	BT[4]	SSC[4]
SAVANNAH SPARROW	PASSERCULUS SANDWICHENSIS	S		
FOX SPARROW	PASSERELLA ILIACA	S		
SONG SPARROW	MELOSPIZA MELODIA	S		
LINCOLN'S SPARROW	MELOSPIZA LINCOLNII	S		
GOLDEN-CROWNED SPARROW	ZONOTRICHIA ATRICAPILLA	S		

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
WHITE-CROWNED SPARROW	ZONOTRICHIA LEUCOPHRYS	S		
HARRIS' SPARROW	ZONOTRICHIA QUERULA	N		
DARK-EYED JUNCO	JUNCO HYEMALIS	S		
LAPLAND LONGSPUR	CALCARIUS LAPPONICUS	N		
SNOW BUNTING	PLECTROPHENAX NIVALIS	N		
WESTERN MEADOWLARK	STURNELLA NEGLECTA	N	BA[4]	
RED-WINGED BLACKBIRD	AGELAIUS PHOENICEUS	S		
YELLOW-HEADED BLACKBIRD	XANTHOCEPHALUS XANTHOCEPHALUS	N		
BREWER'S BLACKBIRD	EUPHAGUS CYANOCEPHALUS	S		
BROWN-HEADED COWBIRD	MOLOTHRUS ATER	S		
BULLOCK'S ORIOLE	ICTERUS BULLOCKII	S		
PURPLE FINCH	CARPODACUS PURPUREUS	S		
HOUSE FINCH	CARPODACUS MEXICANUS	S		
PINE SISKIN	CARDUELIS PINUS	D		
LESSER GOLDFINCH	CARDUELIS PSALTRIA	S		
AMERICAN GOLDFINCH	CARDUELIS TRISTIS	S		
RED CROSSBILL	LOXIA CURVIROSTRA	D		
EVENING GROSBEAK	COCCOTHRAUSTES VESPERTINUS	D		
HOUSE SPARROW	PASSER DOMESTICUS	S		
MAMMALS				
VIRGINIA OPOSSUM	DIDELPHIS VIRGINIANA	S		
PACIFIC WATER SHREW	SOREX BENDIRII	S		
PACIFIC SHREW	SOREX PACIFICUS	S		
TROWBRIDGE'S SHREW	SOREX TROWBRIDGII	S		
VAGRANT SHREW	SOREX VAGRANS	S		
SHREW-MOLE	NEUROTRICHUS GIBBSII	S		
PACIFIC MOLE	SCAPANUS ORARIUS	S		
TOWNSEND'S MOLE	SCAPANUS TOWNSENDII	S		
BIG BROWN BAT	EPTESICUS FUSCUS	S		
SILVER-HAIRED BAT	LASIONYCTERIS NOCTIVAGANS	S	BT[4]	SSU[4]
HOARY BAT	LASIURUS CINEREUS	S		
CALIFORNIA MYOTIS	MYOTIS CALIFORNICUS	S		
LONG-EARED MYOTIS	MYOTIS EVOTIS	K	BT[4]	SSU[4]
LITTLE BROWN MYOTIS	MYOTIS LUCIFUGUS	D		
FRINGED MYOTIS	MYOTIS THYSANODES	S	BS	SSV
LONG-LEGGED MYOTIS	MYOTIS VOLANS	D	BT[4]	SSU[4]

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
YUMA MYOTIS	MYOTIS YUMANENSIS	S	BT[4]	SSU[4]
PACIFIC WESTERN BIG-EARED BAT	CORYNORHINUS TOWNSENDII TOWNSENDII[5]	S	BS[4]	SSC
COYOTE	CANIS LATRANS	S		
GRAY FOX	UROCYON CINEREOARGENTEUS	S		
RED FOX	VULPES VULPES	N		
BLACK BEAR	URSUS AMERICANUS	K		
RINGTAIL	BASSARISCUS ASTUTUS	N	BT	SSU
RACCOON	PROCYON LOTOR	S		
SOUTHERN SEA OTTER	ENHYDRA LUTRIS NEVERS	N	FT	ST
RIVER OTTER	LUTRA CANADENSIS	K		
AMERICAN MARTEN	MARTES AMERICANA	S	BA[4]	SSV[4]
FISHER	MARTES PENNANTI	K	BS[4]	SSC
STRIPED SKUNK	MEPHITIS MEPHITIS	S		
WESTERN SPOTTED SKUNK	SPILOGALE GRACILIS	S		
SHORT-TAILED WEASEL	MUSTELA ERMINEA	S		
LONG-TAILED WEASEL	MUSTELA FRENATA	S		
MINK	MUSTELA VISON	D		
MOUNTAIN LION	FELIS CONCOLOR	D		
BOBCAT	FELIS RUFUS	D		
STELLAR SEA LION	EUMETOPIAS JUBATUS	N	FT	SSV[4]
CALIFORNIA SEA LION	ZALOPHUS CALIFORNIANUS	N		
NORTHERN ELEPHANT SEAL	MIROUNGA ANGUSTIROSTRIS	N		
HARBOR SEAL	PHOCA VITULINA	N		
ROOSEVELT ELK	CERVUS ELAPHUS	K		
BLACK-TAILED & MULE DEER	ODOCOILEUS HEMIONUS	K		
MOUNTAIN BEAVER	APLODONTIA RUFA	S		
NORTHERN FLYING SQUIRREL	GLAUCOMYS SABRINUS	S		
WESTERN GRAY SQUIRREL	SCIURUS GRISEUS	N	BT[4]	SSU[4]
CALIFORNIA GROUND SQUIRREL	SPERMOPHILUS BEECHEYI	S		
TOWNSEND'S CHIPMUNK	TAMIAS TOWNSENDII	S		
DOUGLAS' SQUIRREL	TAMIASCIURUS DOUGLASII	D		
WESTERN POCKET GOPHER	THOMOMYS MAZAMA	S		
GOLD BEACH POCKET GOPHER	THOMOMYS MAZAMA HELLERI	N	BS[4]	
PISTOL RIVER POCKET GOPHER	THOMOMYS UMBRINUS DETUMIDUS	N	BS[4]	
BEAVER	CASTOR CANADENSIS	K		
NUTRIA	MYOCASTOR COYPUS	N		
DEER MOUSE	PEROMYSCUS MANICULATUS	S		

COMMON NAME	LATIN NAME	PRESENT IN NORTH FORK COQUILLE WATERSHED[1]	STATUS FEDERAL[2]	STATUS STATE[3]
WESTERN HARVEST MOUSE	REITHRODONTOMYS MEGALOTIS	N		
HOUSE MOUSE	MUS MUSCULUS	S		
WHITE-FOOTED VOLE	ARBORIMUS ALBIPES	S	BS[4]	SSU
RED TREE VOLE	ARBORIMUS LONGICAUDUS	K		
WESTERN RED-BACKED VOLE	CLETHRIONOMYS CALIFORNICUS	S		
LONG-TAILED VOLE	MICROTUS LONGICAUDUS	S		
CREEPING VOLE	MICROTUS OREGONI	S		
TOWNSEND'S VOLE	MICROTUS TOWNSENDII	S		
PACIFIC JUMPING MOUSE	ZAPUS TRINOTATUS	S		
BUSHY-TAILED WOODRAT	NEOTOMA CINEREA	S		
DUSKY-FOOTED WOODRAT	NEOTOMA FUSCIPES	N		
NORWAY RAT	RATTUS NORVEGICUS	S		
BLACK RAT	RATTUS RATTUS	S		
MUSKRAT	ONDATRA ZBETHICUS	S		
PORCUPINE	ERETHIZON DORSATUM	K		
BRUSH RABBIT	SYLVILAGUS BACHMANI	S		
RIGHT WHALE	EUBALAENA GLACIALIS	N	FE	SE
GRAY WHALE	ESCHRICHTIUS ROBUSTUS	N	FE	SE
BLUE WHALE	BALAENOPTERA MUSCULUS	N	FE	SE
FINBACK WHALE	BALAENOPTERA PHYSALUS	N	FE	SE
SEI WHALE	BALAENOPTERA BOREALIS	N	FE	SE
HUMPBACKED WHALE	MEGAPTERA NOVAEANGLIAE	N	FE	SE
SPERM WHALE	PHYSETER CATODON	N	FE	SE